AMENDMENTS TO THE CLAIMS:

1. (Original)   A method for controlling and monitoring the production of thermoplastic

extrusion profiles, particularly in an in-line production process with print step, characterized by

the following features:

(a)   The use of an optical neuro-fuzzy structured computer/design image data bank (12) for a

visual representation of a thermoplastic extrusion profile design/pattern, wherein

(b)   the client transmits a model for a pattern/design image of an extrusion profile to be

produced in electronic form, meaning via the Internet, e-mail, or a client-specific network

(13a-c) and using a TIFF and/or JPEG file and/or a different data format, to the optical

neuro-fuzzy structured computer/design image data bank (12), and wherein the image

models are stored electronically and optically in the optical neuro-fuzzy structured

computer/design image data bank (12) and are linked to

(c)   an order for producing a design and/or pattern image of a thermoplastic extrusion profile

and

(d)   in the optical neuro-fuzzy structured computer/design image data bank (12), the

production parameters for the basic materials supplied by the material supply facility (1),

the extrusion parameters, including the cooling parameters for the extrusion device with

cooling section (2), the pretreatment parameters for the material pretreatment device (3,

3a-c), the optical design and pattern image data and the printing parameters for the

printing device (4), using the serial background printing technique (4a) and/or the piezo

printing technique (4b), the coating parameters for the coating device (5), the optical

inspection parameters for the optical inspection device (6), and the assembly and

packaging parameters for the assembly and packaging device (7) are electronically and

optically determined, and

(e)   a serial background printing technique (4a) and/or a piezo printing technique (4b) is then

selected for the printing device (4) with the aid of the printing and image/design

parameters stored in the optical neuro-fuzzy structured computer/design image data bank

(12), and

(f)   the client is sent an electronic confirmation via the Internet, e-mail or a client-specific

network (13a-c) from the optical neuro-fuzzy structured computer/design image data bank

(12) of the product and design parameters for producing a thermoplastic extrusion profile.

2. (Original)   The method according to claim 1, characterized in that the optical and electronic

data for the design parameters, the method parameters, and the product parameters are

transmitted via optical neuro-fuzzy structured computer/design image data bank (12) to an

electronic network (10) and/or a cabled and/or radio-controlled Ethernet (10a).

3. (Original)   The method according to claim 2, characterized in that the electronic network (10)

is an electronic intelligent neuronal network (10b).

4. (Currently Amended)   The method according to claim 2 one of the claims 2 to 3, characterized

in that an intelligent neuronal network (10b) connects at least two additional in-line production

lines (11) for producing thermoplastic extrusion profiles and wherein an electronic production planning system (9) determines the degree of utilization of the individual in-line production lines (11).

5. (Currently Amended) The method according to claim 1 ~~one of the claims 1 to~~ 4, characterized in that the optical neuro-fuzzy structured computer/design image data bank (12) electronically transmits to a central control station (8) the product parameters for the basic materials, the extrusion method parameters - including the extrusion cooling parameters - the pretreatment parameters, the optical design and pattern image data and the printing parameters for the serial background printing and/or piezo printing techniques (4a,b), the coating parameters, the optical inspection parameters, as well as the assembly and packaging parameters.

6. (Original) The method according to claim 5, characterized in that the optical and electronic neuro-fuzzy structured computer/design image data transmitted by the data bank (12) to the central control station (8) on the whole are used to control, regulate and monitor the production of at least one in-line production line (11) with the associated devices (1-7) and using the following production steps:

(a)   providing the basic material and material mixture;

(b)   extrusion with subsequent cooling;

(c)   material pretreatment for the printing operation;

(d)   printing by means of a serial background printing technique (4a) and/or a piezo printing technique (4b);

(e)   coating

(f)   optical inspection of the extrusion profile;

(g)   client-specific assembly and packaging.

7. (Original)   The method according to claim 6, characterized in that the electronic and optical neuro-fuzzy structured computer/design image data from the data bank (12) are used to display for the operating personnel in the central control station (8) the production control parameters and the production regulation parameters of the production devices (1-7) by means of a graphic user interface (8a).

8. (Original)   The method according to claim 6, characterized in that the central control station (8) via a network electronically transmits a request for the basic material and/or basic material mixtures, e.g. polyethylene, polypropylene, acryl butadiene styrene, polyvinylchloride etc or mixture combinations, to a material supply facility with distribution system (1) and supplies these materials to the extrusion device (2) for the extrusion process.

9. (Original)   The method according to claim 6, characterized in that the central control station (8) controls and regulates the extrusion process in the extrusion device (2), such that the thermoplastic extrusion profiles are extruded according to client specifications and corresponding to the product parameters and the extrusion parameters stored in the optical neuro-fuzzy structured computer/design image data bank (12).

10. (Currently Amended)   The method according to claim 6 ~~claims 6 and 9~~, characterized in that following the extrusion, the central control station (8) controls and regulates the temperature for the cooling process of the extruded thermoplastic profile.

11. (Original) The method according to claim 6, characterized in that the central control station (8) controls and regulates the material pretreatment process in a material pretreatment device (3) by means of the pretreatment and process parameters.

12. (Original) The method according to claim 11, characterized in that the material pretreatment device (3) comprises a flame-treatment device (3a) and a physical and/or chemical etching device (3b).

13. (Original) The method according to claim 12, characterized in that the physical and/or chemical etching device (3b) realizes a selective and/or reactive ion etching process and/or electro-chemical etching process on the thermoplastic extrusion profile.

14. (Currently Amended)   The method according to claim 12 ~~claims 12—13~~, characterized in that the neuro-fuzzy structured computer/design image data bank (12) controls and regulates the pretreatment parameters and the method parameters for the etching device (3b), as well as the etching process on a thermoplastic extrusion profile in the layer thickness range of 0.5 to 300µm, preferably in the layer thickness range of 2 to 200µm, adapted to the material properties of the thermoplastic extrusion profile.

15. (Currently Amended)   The method according to claim 6 ~~claims 6 and 11~~, characterized in

that following the etching process a bonding agent layer is deposited inside a coating device (3c)

of the material pretreatment device (3), which deposit is controlled and regulated by the central

control station (8).

16. (Original) The method according to claim 6, characterized in that the central control station

(8) controls and regulates the printing step for the thermoplastic extrusion profiles in a printing

device (4), using the neuro-fuzzy structured design/pattern image data and the associated printing

parameters from data bank (12).

17. (Original) The method according to claim 16, characterized in that the printing device (4)

makes use of a background printing technique (4a) and/or a piezo printing technique (4b).

18. (Currently Amended)   The method according to claim 16 ~~claims 16 to 17~~, characterized in

that the multi-colored design/pattern image data and the printing parameters for the printing

operation are stored in the central control station (8) in the form of neuro-fuzzy structured

design/pattern printing image categories and print-control parameter categories to permit a faster

actuation of the printing device (4) which uses the serial background printing technique (4a)

and/or the piezo printing technique (4b).

19. (Currently Amended)   The method according to claim 16 ~~claims 16 to 18~~, characterized in

that the central control station (8) controls and regulates the parallel background printing (4a) and/or piezo-printing techniques (4b) in a printing device (4) by means of the optical neuro-fuzzy structured design/pattern image data and the associated printing parameters, stored in the form of print image categories.

20. (Original) The method according to claim 6, characterized in that the central control station (8) controls and regulates a coating device (5) with the aid of the optical neuro-fuzzy structured coating parameters.

21. (Original) The method according to claim 20, characterized in that the coating device (5) deposits an abrasion-resistant layer, in particular a coat of lacquer, onto the thermoplastic extrusion profile.

22. (Original) The device according to claim 6, characterized in that an optical inspection device (6), comprising an image-recording camera and an evaluation unit (14), records the thermoplastic extrusion profile and transmits the optical and electronic pixel image data (15) to an optical neuro-fuzzy structured computer-aided inspection data bank (16) via radio or electronic network.

23. (Original) The device according to claim 22, characterized in that an electronic and optical image comparison (image mapping) is made between the pixel image data (15) in the optical neuro-fuzzy structured computer-aided inspection data bank (16) and the stored optical neuro-fuzzy structured computer design/design image data (12) for detecting production-related deviations and defects in the printing, applied by the printing device (4; 4a-b), and/or in the

coating deposited by the coating device (5).

24. (Currently Amended) The device according to claim 22 ~~to 23~~, characterized in that the detected, production-related deviations and defects are transmitted via radio or network in the form of optical and electronic data from the optical neuro-fuzzy structured computer-aided inspection data bank (16) to the central control station (8) where they are categorized by means of neuro-fuzzy technology and stored as electronically and optically detected defect image data in the form of defect image categories.

25. (Currently Amended) The method according to claim 6 ~~claims 16 to 21~~, characterized in that the stored neuro-fuzzy categorized defect image data/categories are processed data-technologically in the central control station (8) and that the central control station (8) controls and regulates the correction of these production-related defects, occurring in the printing device (4) that uses the background printing technique (4a) and/or the piezo printing technique (4b), by means of the electronic network (8b).

26. (Currently Amended) The method according to claim 6 ~~claims 6 and 25~~, characterized in that the central control station (8) transmits the defect data for the printing and/or coating operation via electronic network (8b) to the assembly and packaging device (7) and that the assembly and packaging device (7) removes the defective thermoplastic extrusion profiles.

27. (Original) The method according to claim 6, characterized in that the thermoplastic extrusion

profiles produced without defects are assembled and packaged according to client specifications and based on the assembly/packaging parameters stored in the optical neuro-fuzzy structured computer/design image data bank (12).

28. (Original) The method according to claim 1, characterized in that the client is notified via network connection (13 a-c) of the delivery time for the finished thermoplastic extrusion profiles.